Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

Claims 1-11 (Cancelled)

Claim 12 (Currently Amended): The damper of ~~claim 11~~ claim 35 wherein said ~~computer further comprises apparatus for calculating~~ processing structure calculates the frequency and amplitude of said first mass and oscillation of said shaft ~~oscillation~~, and the phase differential between said first mass to said shaft.

Claim 13 (Currently Amended): The damper of ~~claim 11~~ claim 35 wherein said ~~computer~~ processing structure further comprises at least one spectrum analyzer per accelerometer.

Claim 14 (Cancelled)

Claim 15 (Currently Amended): The method of ~~claim 14~~ claim 35 wherein ~~step (iii) comprises calculating a current decrease~~ said processing structure generates a dampening spring stiffness signal that decreases said electromagnetic bond if the amplitude of oscillation of said hub is increasing and amplitude of oscillation of said first mass is decreasing, ~~calculating a current increase~~ and generates a dampening spring stiffness signal that increases said electromagnetic

bond if the amplitude of oscillation of said ~~hub~~ shaft is decreasing and the amplitude of oscillation of said first mass is increasing~~, and calculating no applied current change if oscillation of said hub and oscillation of said mass are constant~~.

Claims 16-27 (Cancelled)

Claim 28 (New): A damper for mitigating torsional vibration of a shaft rotating with an angular velocity about a longintudinal axis, said damper comprising:

a first mass radially outward of said shaft, said first mass oscillating along an arcuate path in a plane perpendicular to said axis;

a passive dampening element coupled to said first mass and to said shaft;

a second mass radially outward of said first mass;

an adjustable dampening element coupled to said second mass and to said first mass; and

a feedback circuit detecting relative movement between said shaft and said first mass resulting from undesired torsional vibration of said shaft and in response, adjusting the stiffness of said adjustable dampening element thereby to dampen said torsional vibration.

Claim 29 (New): The damper of claim 28 wherein said first and second masses are concentric rings.

Claim 30 (New): The damper of claim 29 wherein said passive dampening element comprises diametric first and second spring segments extending between said first mass and said shaft.

Claim 31 (New): The damper of claim 30 wherein said first and second spring segments are affixed to a hub that is secured to said shaft.

Claim 32 (New): The damper of claim 29 wherein said active dampening element comprises diametric first and second active spring segments extending between said second mass and said first mass.

Claim 33 (New): The damper of claim 32 wherein each of said first and second active spring segments comprises a sheath at one end through which said first mass passes.

Claim 34 (New): The damper of claim 29 wherein said feedback circuit comprises sensors detecting movement of said shaft and first mass and processing structure communicating with said sensors and said electromagnetic bond, said processing structure adjusting the strength of said electromagnetic bond in response to output received from said sensors.

Claim 35 (New): A damper for reducing torsional vibration of a shaft rotating about its longitudinal axis, said damper comprising:

a first mass radially outward of said shaft, said first mass oscillating along an arcuate path in a plane perpendicular to said axis;

a first spring physically coupled to said first mass and to said shaft;

a second mass radially outward of said first mass;

a second spring physically coupled to said second mass and coupled to said first mass via an adjustable electromagnetic bond;

accelerometers coupled to the first mass and the shaft and outputting signals in response to acceleration of said first mass and said shaft resulting from undesirable torsional vibration of said shaft;

a processor communicating with said accelerometers, said processor structure processing said signals and generating a dampening spring stiffness signal; and

a current generator communicating with said processor, said current generator, in response to said dampening spring stiffness signal, adjusting the electromagnetic bond thereby to dampen said torsional vibration.

Claim 36 (New): The damper of claim 35 wherein said first and second masses are concentric rings.

Claim 37 (New): The damper of claim 36 wherein said first spring comprises diametric first and second spring segments extending between said first mass and said shaft.

Claim 38 (New): The damper of claim 35 wherein said first and second spring segments are affixed to a hub that is secured to said shaft.

Claim 39 (New): The damper of claim 35 wherein said second spring comprises diametric first and second active spring segments extending between said second mass and said first mass.

Claim 40 (New): The damper of claim 39 wherein each of said first and second active spring segments comprises a sheath at one end through which said first mass passes.

Claim 41 (New): A method of damping torsional vibration of a shaft rotating about its longitudinal axis using a damper, said damper comprising a first mass radially outward of said shaft and physically coupled to said shaft via a first spring and a second mass radially outward of said first mass and coupled to said first mass via a second spring and an electromagnetic bond, said method comprising:

(i) oscillating said first mass angularly with respect to said shaft in a manner that absorbs energy with a resonance related to the total effective spring constants of the first and second springs;

(ii) identifying harmonic motion in said first mass relative to said shaft as a result of undesired torsional vibration of said shaft;

(iii) calculating, in response to said harmonic motion identifying, current changes that, when applied by a current generator to said electromagnetic bond, adjust the strength of said electromagnetic bond thereby to change the total effective spring constant; and

(iv) applying the calculated current changes to said electromagnetic bond thereby to adjust its strength and dampen said torsional vibration.

Claim 42 (New): A method for damping torsional vibrations of a rotating shaft wherein said shaft includes a hub, a first mass physically coupled to said hub via a first spring and a second mass coupled to said hub via a second spring and electromagnetic bond, said method comprising:

(i) oscillating said first mass angularly with respect to said hub in a manner that absorbs energy with a resonance related to the total effective spring constants of the first and second springs;

(ii) identifying undesired harmonic motion in said mass relative to said hub;

(iii) calculating applied current changes that, when applied by a current generator to said electromagnetic bond, change the total effective spring constant and improve dampening of the detected undesired harmonic motion; and

(iv) applying said current changes to said electromagnetic bond, wherein said calculating comprises:

calculating a current decrease if amplitude of oscillation of said hub is increasing and amplitude of oscillation of said mass is decreasing; and

calculating a current increase if oscillation of said hub is decreasing and oscillation of said mass is increasing.

Claim 43 (New): A method for damping torsional vibrations of a rotating shaft wherein said shaft includes a hub, a first mass physically coupled to said hub via a first spring and a second mass coupled to said hub via a second spring and electromagnetic bond, said method comprising:

(i) oscillating said first mass angularly with respect to said hub in a manner that absorbs energy with a resonance related to the total effective spring constants of the first and second springs;

(ii) identifying undesired harmonic motion in said first mass relative to said hub;

(iii) calculating applied current changes that, when applied by a current generator to said electromagnetic bond, change the total effective spring constant and improve dampening of the detected undesired harmonic motion; and

(iv) applying said current changes to said electromagnetic bond, wherein said calculating comprises:

calculating a current decrease and mass amplitude increase if the amplitude of oscillation of said hub is increasing; and

calculating a current increase and mass amplitude increase if oscillation of said hub is decreasing.